

(c) REMARKS

This application has been carefully reviewed in light of the Office Action dated October 4, 2004. Claims 9-11 have been cancelled herein, without prejudice or disclaimer of subject matter and without conceding the correctness of the rejections thereof and their subject matter added to claim 1. Claims 1, 3, 5 and 13 remain in the application, of which claim 1 is the sole independent claim.

Support for amended claim 1 is found, inter alia, on page 13, lines 11-16, in Fig. 3 and in the supporting disclosure therefor, on page 14, lines 15-27.

Claims 1, 3, 5, 9 and 13 were rejected under 35 U.S.C. §103 over U.S. Patent No. 6,420,834 (Yamazaki) in view of Matsuura '413. Claims 10 and 11 were rejected under 35 U.S.C. §103(a) over Yamazaki in view of Matsuura, and further in view of U.S. Patent No. 6,187,151 (Leiphart). Applicants respectfully traverse these rejections.

Prior to addressing the rejections, Applicants wish to briefly review certain key features and advantages of the present claimed invention. Initially, the subject matter of claims 9-11 has been added to claim 1.

When another organic compound is deposited on the instant hole transport compound, then, to provide good adhesion and luminance, the surface of the hole transport layer is pre-treated with an oxygen plasma or inert gas plasma of specific intensity. As noted on specification page 11, the work function of the anode is enhanced to improve charge injection and surface irregularities are reduced to improve adhesiveness by such treatment. As shown in the Examples, in Comparative Examples 2 and 3 on pages 32-35 and in Tables 2 and 3, use of the instant oxygen or inert gas plasmas unexpectedly enhance luminance in combination with application of the DC voltage of 10-100 V.

With regard to application of DC voltage, the specification clearly teaches that if voltage below 10 V is applied to the anode, no electron transfer significantly occurs which results in insufficient adhesion of the organic layer to the anode. If voltage over 100 V is applied, poor adhesion occurs because of oxidation and/or decomposition of the hole transport substance. The instant Examples also show the criticality of applying 10-100 V. In the instant Comparative Examples no voltage is applied; i.e., less than 10 V, and poor results are found. Further, no oxygen or inert gas plasma is employed of the instant intensity in the Comparative Examples.

Yamazaki simply provides no guidance in achieving the method of the present invention. Yamazaki teaches negatively or positively charging EL material directly; the present invention requires the application of a positive DC voltage to an anode. None of the secondarily cited references remedy the above-noted deficiencies of Yamazaki.

Further, Yamazaki teaches in column 18, lines 60-65 that voltage applied is preferably 5 V or less to prevent hot carrier deterioration. However, an applied voltage less than 10 V in Applicants' process does not provide sufficient adhesion of the organic layer to the anode. If 5 V or less is preferred by Yamazaki, why would the artisan be motivated to employ more than 10 volts. Therefore, Yamazaki teaches away from applying voltages from 10 V to 100 V.

The Examiner argues that while Yamazaki is admittedly silent as to the amount of voltage applied to the electrode, it would be obvious to optimize the voltages. Yamazaki, at best, merely provides an invitation to experiment to determine what voltages would succeed. Applicants have shown that lower or higher voltages than 10 - 100 V can

defeat the present invention. The only disclosure of “magnitude” of voltage present in Yamazaki is a value too low for the present invention.

To remedy the lack of teaching of oxygen plasma or inert gas plasma surface treatment, the Examiner relies on Leiphart ‘151. However, Leiphart ‘151 does not teach plasma energies at 10-80 eV for oxygen or 20-100 eV for argon. Leiphart merely teaches gas ions having energy of 0 to 50 eV in the plasma. There is no suggestion in Leiphart for the instant plasma energies in combination with application of specific positive DC voltage to provide unexpectedly enhanced results. In the Example of Leiphart the applied voltage, during deposition, appears to be much higher than the 10-100 V as claimed herein. Further, the showing of unexpectedly superior results herein rebuts any possible presumption of obviousness.

Based on the foregoing amendments and remarks, independent Claim 1 is believed to be allowable. The other rejected claims in the application are each dependent on this independent claim and are believed to be allowable for at least the same reason. Accordingly, favorable reconsideration and passage to issue of the present case is respectfully requested. Should the Examiner believe that issues remain outstanding, the Examiner is respectfully requested to contact Applicants’ undersigned attorney in an effort to resolve such issues and advance the case to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter Saxon", written over a horizontal line.

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